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Production of Mutants Affected in Hormone Signalling to Dissect Defence Mechanisms in *Hevea brasiliensis*: The Case of Ethylene

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Production of mutants by genetic transformation is one alternative to dissect the response to hormonal treatment. Ethylene is an important plant hormone involved in latex production. Transgenic *Hevea brasiliensis* plants overexpressing an ethylene mutant receptor *etr1-1* from *Arabidopsis thaliana* were regenerated. These plants did not show any morphological response the ethephon stimulation. This plant material is a source of information to understand the role of ethylene in *Hevea brasiliensis*.

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microRNAs: New Regulators of Biological Functions in *Hevea brasiliensis*

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Fine regulation of gene expression is partially ensured by microRNAs (miRNAs) in response to external stimuli. They negatively regulate gene expression by targeting the cleavage or inhibit the translation of target messenger RNAs (mRNAs). In *Hevea brasiliensis*, environmental and harvesting stresses are known to affect natural rubber production. Deep sequencing of small RNAs was carried out on plantlets, subjected to severe abiotic

stress, and on latex from trees affected or not by TPD, using the Solexa technique. By combining the LeARN pipeline, data from the Plant microRNA database (PMRD) and *Hevea* EST sequences, we identified 68 conserved miRNA families already characterized in other plant species, and 15 putatively novel miRNA families. MiRNA targets were computationally predicted and analysed. Targets involved in rubber biosynthesis, ROS-scavenging systems and ethylene perception and transduction pathway are presented.

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Genetic Transformation and Regeneration of *Hevea brasiliensis* Transgenic Plant with *GAI* Gene

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Typhoon is a major natural disaster in *Hevea brasiliensis* cultivation areas in China. The degree of typhoon damage has positive correlation with height of tree. In this report, the gene coding for *GAI* was selected for the genetic transformation by microparticle bombardment method. The vector pBI121, which contains CaMV35S promoter, kanamycin resistance gene, *GUS* reporter gene and *GAI* gene, was used for the transferring of *H.brasiliensis* anther callus. Regenerated plantlets were obtained on a subculture medium supplemented with 50 mg l^{-1}kanamycin. The result showed that the embryoid induction rate can reach to 1.87% when shot at 6 cm distance from the resist net to calli, and the transformation was confirmed by histochemical staining using X-Gluc (5-bromo-4 chloro-3-indolyl b-d glucuronide) and presenting positive by analysis PCR and Southern blotting. The result demonstrated that genetic transformation of *H.brasiliensis* callus with the gene coding for *GAI* and the regeneration of transgenic plant could be done successfully by microparticle bombardment method. The transgenic plants may become dwarfing phenotype and increasing tolerance to typhoon damage.